

REMARKS

Favorable reconsideration of this application, in light of the following discussion and in view of the present amendment, is respectfully requested.

Claims 1-14 are pending.

I. Rejection under 35 U.S.C. § 102

In the Office Action, at page 2, numbered paragraph 6, claims 1-3, 7 and 8 were rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent Publication No. 2005/0109836 to Ben-Aissa. This rejection is respectfully traversed because Ben-Aissa does not discuss or suggest:

a fingerprint image storing part storing representative reference fingerprint images and at least one auxiliary reference fingerprint image for registered users; and

a control part determining whether one of the representative reference fingerprint images matches a first input fingerprint image input through the fingerprint scan part, reading auxiliary reference fingerprint images corresponding to a matching representative reference fingerprint image, and comparing other fingerprint images input after the first input fingerprint image with the auxiliary reference fingerprint images to determine user authentication,

as recited in independent claim 1.

Further, Ben-Aissa does not discuss or suggest:

storing representative reference fingerprint images and at least one auxiliary reference fingerprint image, according to registered users;...

reading auxiliary reference fingerprint images corresponding to a matching representative reference fingerprint image;

receiving additional fingerprint images sequentially input by the user; and

determining whether the user is authenticated by respectively comparing the additional input fingerprint images with the corresponding auxiliary reference fingerprint images.

as recited in independent claim 7.

As a non-limiting example, the present invention according to claim 1, for example, is directed to a security system using fingerprints including a fingerprint scan part, a fingerprint image storing part, and a control part. The fingerprint scan part creates a fingerprint image when a finger contacts the fingerprint scan part. The fingerprint image storing part stores

representative reference fingerprint images and at least one auxiliary reference fingerprint image for registered users. The control part determines whether one of the representative reference fingerprint images matches a first input fingerprint image input through the fingerprint scan part and then reads auxiliary reference fingerprint images corresponding to a matching representative reference fingerprint image. Other fingerprint images input after the first input fingerprint image are compared with the auxiliary reference fingerprint images to authenticate the user.

Ben-Aissa discusses a biometric multi-purpose terminal payroll and work management system that includes a terminal 20 having a biometric device 30, such as a fingerprint reader and comparator. The terminal 20 may also have a magnetic card reader 38 to read encoded information from a magnetic strip disposed on a bankcard 23. In Ben-Aissa, an employee may place a fingerprint on the fingerprint reader 30 of terminal 20, and terminal 20 then compares the fingerprint from fingerprint reader 30 with fingerprint scans that were made when the employee was first registered on the system. If the fingerprint reading is matched with the fingerprint on file, a screen appears on terminal 20 requesting further information, which may be a social security number or requesting that the employee swipe his/her bankcard 23 in the slot of a bankcard reader 22. The social security number or bankcard information are used to supplement the fingerprint identity.

Ben-Aissa further discusses that when a new employee is registering, the employee places a finger on the fingerprint reader 30 in order to capture a fingerprint image. The user is prompted to accept or not accept images of the fingerprint. The terminal 20 may then request, after the first captured image is accepted by the employee that additional images of the fingerprint be entered and captured for future comparison purposes. An appropriate number of additional fingerprint images are then captured.

While Ben-Aissa does discuss a fingerprint image storing part that stores representative reference fingerprint images, Ben-Aissa does not discuss or suggest that the image storing part additionally stores at least one auxiliary reference fingerprint image for registered users. In alleging that Ben-Aissa discusses storing representative reference fingerprint images and at least one auxiliary reference fingerprint image for registered users, the Examiner refers to the fact that terminal 20 in Ben-Aissa compares an input fingerprint from a fingerprint reader 30 with fingerprint scans that were made when the employee was first registered. However, merely comparing input fingerprint images from the employee does not suggest also storing at least one auxiliary reference fingerprint image for registered users. Being requested to enter further

information, such as an employee number or the employee's bankcard 23 information, does not correspond to an auxiliary reference fingerprint image for registered users. Bankcard information or social security numbers are not fingerprint images nor can they be considered to be auxiliary reference fingerprint images.

In addition, Ben-Aissa does not discuss or suggest a control part which reads auxiliary reference fingerprint images corresponding to a matching representative reference fingerprint image, where the first input fingerprint image is matched with one of the representative reference fingerprint images. Also, Ben-Aissa does not discuss or suggest comparing other fingerprint images input after the first input fingerprint image with the auxiliary reference fingerprint images to determine user authentication.

Ben-Aissa discusses that additional images of a fingerprint may be entered and captured for future comparison purposes, but includes no discussion of matching a first input fingerprint image with representative reference fingerprint images and then reading auxiliary reference fingerprint images corresponding to the matching representative reference fingerprint image. Ben-Aissa discusses only that when a new employee is registering a fingerprint image, the image is captured when the employee places a finger on the fingerprint reader 30 and the employee is prompted to determine whether the images captured are acceptable or unacceptable. After the first captured image is accepted by the user as acceptable, additional images of the same fingerprint may be entered and captured for future comparison purposes. The additional images of the fingerprint are not auxiliary reference fingerprint images that correspond with a matching representative reference fingerprint image. The additional images of the fingerprint correspond exactly to the first input fingerprint image. The additional images do not correspond to a matching representative reference fingerprint image which is matched between a first input fingerprint image and representative reference fingerprint images that have already been stored in a fingerprint image storing part.

Further, Ben-Aissa includes no discussion of comparing other fingerprint images which are input after the first input fingerprint image with the auxiliary reference fingerprint images in order to determine user authentication. Ben-Aissa does not suggest that the additional images of the fingerprint that are captured are either auxiliary reference fingerprint images or other fingerprint images that are input after a first input fingerprint image. Additionally, Ben-Aissa does not discuss or suggest comparing other fingerprint images input after the first input fingerprint image with auxiliary reference fingerprint images that correspond to a matching representative reference fingerprint image, where the matching representative reference fingerprint image is a

match between a first input fingerprint image and one of stored representative reference fingerprint images.

In addition, swiping of a bankcard to obtain bankcard information or inputting of a social security number are not auxiliary reference fingerprint images.

As to claim 7, Ben-Aissa includes no discussion of reading auxiliary reference fingerprint images that correspond to a matching representative reference fingerprint image, the matching representative reference fingerprint image being a match between a first input fingerprint image and one of stored representative reference fingerprint images. Further, Ben-Aissa does not suggest receiving additional fingerprint images sequentially input by the user, and Ben-Aissa does not determine whether the user is authenticated by comparing the additional input fingerprint images with the corresponding auxiliary reference fingerprint images. The Examiner fails to distinguish a first input fingerprint image, auxiliary reference fingerprint images, and additional fingerprint images which are sequentially input by a user. Ben-Aissa includes no discussion at all of sequentially inputting fingerprint images by a user but merely discusses that additional images of the fingerprint are entered and captured for future comparison purposes.

Therefore, as Ben-Aissa does not discuss or suggest, "a fingerprint image storing part storing ... at least one auxiliary reference fingerprint image for registered users; and a control part ... reading auxiliary reference fingerprint images corresponding to a matching representative reference fingerprint image, and comparing other fingerprint images input after the first input fingerprint image with the auxiliary reference fingerprint images to determine user authentication," as recited in independent claim 1, and Ben-Aissa does not discuss or suggest, "storing ... at least one auxiliary reference fingerprint image, according to registered users;... determining whether one of the stored representative reference fingerprint images matches the first input fingerprint image; reading auxiliary reference fingerprint images corresponding to a matching representative reference fingerprint image; receiving additional fingerprint images sequentially input by the user; and determining whether the user is authenticated by respectively comparing the additional input fingerprint images with the corresponding auxiliary reference fingerprint images," as recited in independent claim 7, claims 1 and 7 patentably distinguish over the reference relied upon. Accordingly, withdrawal of the § 102(a) rejection is respectfully requested.

Claims 2, 3 and 8 depend either directly or indirectly from independent claims 1 and 7 and include all the features of their respective independent claims, plus additional features that are not discussed or suggested by the reference relied upon. For example, claim 3 recites, "a

fingerprint registering part sequentially storing fingerprint images input through the fingerprint scan part by an unregistered user in the fingerprint image storing part, and displaying the stored fingerprint images of the unregistered user for the unregistered user to select one of the stored fingerprint images as the representative reference fingerprint image." Therefore, claims 2, 3 and 8 patentably distinguish over the reference relied upon for at least the reasons noted above. Accordingly, withdrawal of the § 102(a) rejection is respectfully requested.

As a side note, the present invention was filed prior to the filing date of July 20, 2004 of Ben-Aissa and the publication date of May 26, 2005. As such, Ben-Aissa may only be used as a reference under 35 U.S.C. § 102(e).

II. Rejection under 35 U.S.C. § 103

In the Office Action, at page 12, numbered paragraph 8, claims 4-6 and 9-14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ben-Aissa further in view of U.S. Patent Publication No. 2002/0122026 to Bergstrom. This rejection is respectfully traversed.

As discussed above with respect to independent claim 1, from which claims 4-6 and 9-12 ultimately depend, Ben-Aissa does not discuss or suggest all the features of independent claim 1. Bergstrom fails to make up for the deficiencies in Ben-Aissa. Therefore, claim 1 patentably distinguishes over the references relied upon.

Claims 4-6 and 9-12 depend either directly or indirectly from independent claims 1 and 7 and include all the features of their respective independent claims, plus additional features that are not discussed or suggested by the references relied upon. For example, claim 5 recites that, "the fingerprint scan part comprises multiple fingerprint input keys having order values sequentially selected by the unregistered user; and the fingerprint registering part stores a combination of input fingerprint images contacting the fingerprint input keys selected by the unregistered user and the order values in the fingerprint image storing part." Therefore claims 4-6 and 9-12 patentable distinguish over the references relied upon for at least the reasons noted above. Accordingly, withdrawal of the § 103(a) rejection is respectfully requested.

As to claims 13 and 14, the combination of the teachings of Ben-Aissa and Bergstrom does not suggest:

displaying the stored fingerprint images for the unregistered user to select one of the stored fingerprint images as a representative reference fingerprint image;

displaying the stored fingerprint images for the unregistered user to select and order one or more of the stored fingerprint images as ordered auxiliary reference fingerprint images;

registering the user with the corresponding representative reference fingerprint image and the auxiliary reference fingerprint images;...

receiving, when the first fingerprint image matches one of the stored representative reference fingerprint images, additional fingerprint images sequentially input by the user to be authenticated; and

determining whether each of the additional fingerprint images matches auxiliary reference fingerprint images corresponding to the representative reference fingerprint image that matches the first fingerprint image, and whether the additional fingerprint images are input according to the selected order of the corresponding auxiliary reference fingerprint images

as recited in independent claim 13.

The present invention, according to claim 13, for example, is directed to a fingerprint security method in which stored fingerprint images are displayed for an unregistered user to select one of as a representative reference fingerprint image and to select and order one or more of the images as ordered auxiliary reference fingerprint images. In addition, the user is registered with the corresponding representative reference fingerprint image and the auxiliary reference fingerprint image. Then, after a first fingerprint image matches one of the stored representative reference fingerprint images, additional fingerprint images sequentially input by the user to be authenticated are received and it is determined whether each of the additional fingerprint images matches auxiliary reference fingerprint images corresponding to the representative reference fingerprint image that matches the first fingerprint image and whether the additional fingerprint images are input according to the selected order of the corresponding auxiliary reference fingerprint images.

As discussed above with respect to independent claims 1 and 7, Ben-Aissa fails to discuss or suggest the storage of an auxiliary reference fingerprint image. Further, as discussed above, Ben-Aissa does not discuss or suggest that additional fingerprint images are compared to auxiliary reference fingerprint images. In addition, Ben-Aissa does not discuss or suggest receiving fingerprint images for each finger of one or more unregistered users and displaying the stored fingerprint images for the unregistered user to select one of the stored fingerprint images as a representative reference fingerprint image. Ben-Aissa discusses that a new employee provides images of a single finger, displays the fingerprint images and allows the user to select one of the captured fingerprint images as a reference image for future comparison efforts during authentication procedures. However, Ben-Aissa does not suggest that the employee selects one of multiple stored fingerprint images as a representative reference fingerprint image.

Also, Ben-Aissa does not discuss or suggest that stored fingerprint images are displayed for an unregistered user to select and order one or more of the stored fingerprint images as ordered auxiliary reference fingerprint images. Ben-Aissa further does not discuss or suggest the receipt of additional fingerprint images that are sequentially input by a user to be authenticated when a first fingerprint image matches one of stored representative reference fingerprint images, nor does Ben-Aissa determine whether each of additional fingerprint images matches auxiliary reference fingerprint images corresponding to the representative reference fingerprint image that matches the first fingerprint image, and Ben-Aissa does not determine whether the additional fingerprint images are input according to a selected order of the corresponding auxiliary reference fingerprint images. The Examiner indicates that Bergstrom makes up for the deficiencies in Ben-Aissa. The Applicants respectfully disagree.

Bergstrom discusses a fingerprint sensor and position controller including a fingerprint touchpad 400 and a computer 405. A fingerprint interpreter 415 and a 2-dimensional position interpreter 420 read information input from a fingerprint scanner 410. Bergstrom further discusses that information furnished by the fingerprint scanner 410 consists of a high resolution bitmap of the surface of the fingerprint touchpad 400. The fingerprint interpreter 415 generates the sequence of characteristic data (fingerprint map) that represents the sensed fingerprint image, and the identity verification system 435 in the computer 405 reads the fingerprint map and determines whether the fingerprint map matches the stored reference fingerprint image. The 2-dimensional position interpreter 420 generates an X-Y coordinate position of the center of the fingerprint map on the contact surface 22 and a mouse driver program 440 reads the X-Y coordinate position and uses the information to control the position of a visual cue on a display screen. However, Bergstrom is merely identifying a fingerprint image and identifying the coordinate position of the fingerprint in relation to the contact surface 22 upon which the fingerprint has been placed. Bergstrom does not make up for the deficiencies in Ben-Aissa.

Specifically, Bergstrom does not discuss or suggest displaying stored fingerprint images for unregistered users to select one of the stored fingerprint images as a representative reference fingerprint image, or displaying stored fingerprint images for an unregistered user to select and order one or more of the stored fingerprint images as ordered auxiliary reference fingerprint images. There is no discussion at all in Bergstrom of selecting stored fingerprint images from a display and ordering the stored fingerprint images as ordered auxiliary reference fingerprint images. In addition, Bergstrom does not discuss or suggest receiving additional fingerprint images sequentially input by the user to be authenticated when a first fingerprint image matches one of the stored representative reference fingerprint images. Merely

determining whether a fingerprint map matches a stored reference fingerprint image and generating an X-Y coordinate position of the center of the fingerprint map on a contact surface in order to control the position of a visual cue on a display screen is not receiving additional fingerprint images sequentially input by a user to be authenticated when a first fingerprint image matches one of stored representative reference fingerprint images.

Further, Bergstrom does not discuss or suggest determining whether each of additionally input fingerprint images matches auxiliary reference fingerprint images corresponding to a representative fingerprint image that matches a first fingerprint image and determining whether the additional fingerprint images which are sequentially input by a user are input according to the selected order of the corresponding auxiliary reference fingerprint images. Bergstrom includes no discussion of determining a selected order of fingerprint images which are input after a first fingerprint is matched to a representative reference fingerprint image, nor does Bergstrom include any discussion of the additional fingerprint images having been sequentially input by a user to be authenticated.

In addition, the motivation cited of “perform[ing] both fingerprint sensing and matching for identification purposes, and control[ing] the position of a cursor on a display screen for data input purposes” does not suggest why one of ordinary skill in the art would combine a biometric multi-purpose terminal that allows a user to input images of a finger and compares the input images with previously submitted images of a fingerprint of Ben-Aissa with the fingerprint sensor and position controller of Bergstrom to suggest receiving additional fingerprint images sequentially input by a user to be authenticated when a first fingerprint image matches one of stored representative reference fingerprint images and to suggest determining whether each of the additional fingerprint images that were input matches auxiliary reference fingerprint images corresponding to a representative reference fingerprint image that matches the first fingerprint image and to suggest determining whether the additional fingerprint images which are sequentially input are input according to a selected order of the corresponding auxiliary reference fingerprint images. Merely accepting fingerprint images for identification purposes and controlling the position of a cursor does not in any way provide an adequate motivation to one of ordinary skill in the art with respect to determining whether additional fingerprint images are input according to a selected order.

Therefore, as the combination of the teachings of Ben-Aissa and Bergstrom does not suggest, “displaying the stored fingerprint images for the unregistered user to select one of the stored fingerprint images as a representative reference fingerprint image; displaying the stored

fingerprint images for the unregistered user to select and order one or more of the stored fingerprint images as ordered auxiliary reference fingerprint images; registering the user with the corresponding representative reference fingerprint image and the auxiliary reference fingerprint images;... receiving, when the first fingerprint image matches one of the stored representative reference fingerprint images, additional fingerprint images sequentially input by the user to be authenticated; and determining whether each of the additional fingerprint images matches auxiliary reference fingerprint images corresponding to the representative reference fingerprint image that matches the first fingerprint image, and whether the additional fingerprint images are input according to the selected order of the corresponding auxiliary reference fingerprint images," as recited in independent claim 13, and as the motivation cited to combine the references is inadequate to suggest all the features of independent claim 13, claim 13 patentably distinguishes over the references relied upon. Accordingly, withdrawal of the § 103(a) rejection is respectfully requested.

Claim 14 depends directly from independent 13 and includes all the features of claim 13, plus additional features that are not discussed or suggested by the references relied upon. For example, claim 14 recites, "displaying an error message when the first input fingerprint image does not match any of the representative reference fingerprint images." Therefore, claim 14 patentably distinguishes over the references relied upon for at least the reasons noted above. Accordingly, withdrawal of the § 103(a) rejection is respectfully requested.

Conclusion

In accordance with the foregoing, claims 1-14 are pending and under consideration.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

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By: Kari P. Footland

Kari P. Footland
Registration No. 55,187

1201 New York Avenue, NW, 7th Floor
Washington, D.C. 20005
Telephone: (202) 434-1500
Facsimile: (202) 434-1501